Patent claims:

1. An apparatus for reforming rod-shaped, electrically conductive and/or magnetizable materials (2), in particular for drawing and extruding, having the following features:

- the apparatus (1) has a female mold (3) having a die (2), which forms the tool for reforming;

- the apparatus (1) has an inductor (5) of an electric linear motor, by means of which a traveling electric field can be produced;

- the inductor (5) comprises at least one first group (6) at least with first coils (8);

- the first coils (8) in the first group (6) are arranged axially next to one another and thus form a channel (12);

- using the inductor (5) it is possible to produce a traveling field in the channel (12) which has a magnetic flux density having a gradient in the axial direction of the channel (12),

characterized in that

the gradient has an amplitude of greater than B = 1 T, and at least some of the coils (8) have a conductor (9) which has a resistivity of r = 0.017 * 10-6 Wm or less.

2. The apparatus as claimed in the preceding claim, characterized in that the inductor (5) has a second group (7) at least with first coils (8).

3. The apparatus as claimed in the preceding claim, characterized in that the first group (6) and the second group (7) are arranged on opposite sides of the female mold (3), the first coils (8) of the two groups being coaxial with respect to the die (4) of the female mold (3).

4. The apparatus as claimed in one of the preceding claims, characterized in that the first group (6) and possibly the second group (7) have second coils, which engage around the first coils and are coaxial with respect to the first coils.

5. The apparatus as claimed in the preceding claim, characterized in that the first group (6) and possibly the second group (7) have further, namely third, fourth, ... n-th coils, which engage around the second or third, ... (n-1)-th coils and are coaxial with respect to the second or third, ... (n-1)-th coils.

6. The apparatus as claimed in one of the preceding claims, characterized in that in each case a disk (10) made of a magnetizable material is arranged between coils (8) which are arranged coaxially next to one another.

7. The apparatus as claimed in the preceding claim, characterized in that the disks (8) have an outer edge (11) which is bent back to one side.

8. The apparatus as claimed in the preceding claim, characterized in that the bent-back edge (11) covers an adjacent, first coil (8) or a stack of adjacent and coaxially arranged coils.

9. The apparatus as claimed in one of the preceding claims, characterized in that the apparatus (1) has means for cooling the rod-shaped material (2) to be

reformed.

10. The apparatus as claimed in the preceding claim, characterized in that the means for cooling apply a first cooling medium to the channel (12).

11. The apparatus as claimed in the preceding claim, characterized in that the first cooling medium is air or an oil.

12. The apparatus as claimed in the preceding claim, characterized in that the electrical current density in the coils (8) is greater than $J = 10\ A/mm^2$.

13. The apparatus as claimed in one of the preceding claims, characterized in that at least some of the coils (8) have conductors (9) which are superconducting.

14. The apparatus as claimed in the preceding claim, characterized in that the superconducting conductors (9) are made of a material which has a critical temperature of greater than $T = 77\ K$.

15. The apparatus as claimed in one of the preceding claims, characterized in that at least some of the coils (8) have conductors (9) which have a channel (12).

16. The apparatus as claimed in the preceding claim, characterized in that a second cooling medium can be applied to the channel (12) in the conductor (9).

17. A method for reforming rod-shaped, electrically conductive and/or magnetizable materials (2), in particular drawing and extruding, using the apparatus as claimed in one of claims 1 to 16, having the following steps:

a) in one step, the material to be reformed is introduced into a channel (12);

b) in one step, a traveling magnetic field having a gradient lying in the channel direction is produced in the channel (12) and has, in the center of the channel (12), a magnetic flux density having an amplitude of greater than B = 1 T;

in one step, the material (2) is introduced into the die (4) of the female mold (3).

18. The method as claimed in the preceding claim, characterized in that firstly step c), followed by step a), followed by step b) in accordance with claim 17 is carried out.

19. The method as claimed in claim 17, characterized in that firstly step c), followed by step b), followed by step a) in accordance with claim 17 is carried out.

20. The method as claimed in claim 17, characterized in that firstly step a), followed by step b), followed by step c) in accordance with claim 17 is carried out.

21. The method as claimed in claim 17, characterized in that firstly step b), followed by step a), followed by step c) in accordance with claim 17 is carried out.

22. The method as claimed in claim 17, characterized by the following steps:

a1) in one step, the material (2) to be reformed is introduced into a first part of the channel (12);

a2) in one step, the material (2) is introduced into a second part of the channel (12);

b1) in one step, the traveling magnetic field is produced in the first part of the channel (12);

b2) in one step, the traveling magnetic field is produced in the second part of the channel (12).

23. The method as claimed in claim 22, characterized in that the steps are carried out in the following sequence: a1), c), b1) + b2).

24. The method as claimed in claim 22, characterized in that the steps are carried out in the following sequence: b1) + b2), a1), c), a2).